ORIGINAL

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in Bands Shared With Terrestrial Fixed Service	)	IB Docket No. 02-10
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	)	

To: The Commission

COMMENTS OF MARITIME TELECOMMUNICATIONS NETWORK, INC.

MARITIME TELECOMMUNICATIONS NETWORK, INC.

By: Raul R. Rodriguez
Stephen D. Baruch
Philip A. Bonomo

Leventhal, Senter & Lerman P.L.L.C.
2000 K Street, NW
Suite 600
Washington, DC 20006
(202) 429-8970

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Its Attorneys

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SUMMARY

Maritime Telecommunications Network, Inc. ("MTN"), the leading provider of commercial satellite communications services to points at sea, is keenly interested in the Commission's inquiry into the authorization of satellite earth stations on board vessels ("ESVs"). As it considers this important matter, MTN urges the Commission to develop a regulatory approach for ESVs that ensures the adequate protection of the fixed service ("FS") while accommodating – and not unduly burdening or constraining – the use of ESVs in fixed-satellite service ("FSS") networks.

Over the past ten years, ESVs have become an indispensable component of the successful operation of cruise lines and other maritime applications. In that time, MTN has demonstrated that it is able to provide ESV-based communication services in a manner consistent with domestic regulatory regimes and principles of sound spectrum management. Significantly, no service provider possesses the capacity, speed, affordability and global reach to offer a range of broadband services comparable to those available through ESVs.

As its business has developed and grown over the past decade, MTN has remained a model "spectrum citizen." While the possibility of interference into fixed service operations from ESVs exists in theory and must be meaningfully addressed, to date there have been no substantiated instances of interference from ESVs to FS stations under normal operating conditions. This impressive record of co-existence between ESVs and the FS must guide the Commission's decision-making throughout the course of this proceeding.

Regarding the most appropriate bands for ESVs, the Commission must allow ESVs to operate in the FSS networks in C-band (at 5925-6425 MHz) and in Ku-band (at 14.0-14.5 GHz). C-band provides full oceanic coverage, available capacity, and is already in use on many ESV-equipped vessels. Moreover, C-band FSS spectrum has effectively and efficiently

accommodated ESVs for many years without causing interference to other operations. Indeed, ESV/FS compatibility is more than just possible at C-band, it is routine. Furthermore, because MTN (and others) have invested significant amounts of money in C-band operations, a Commission decision to prohibit or restrict ESV access to C-band would vitiate MTN's business and render millions of dollars in capital investment obsolete, with a concomitant loss of service to cruise lines and its passengers.

The FSS Ku-band uplink at 14.0-14.5 GHz should be available to ESVs where commercially and technically appropriate because, in certain instances where there are no terrestrial services, Ku-band can alleviate coordination difficulties that may arise with the use of the shared C-band. For reasons of technical and commercial necessity, however, operations at Ku-band must serve to complement, and not to replace, operations at C-band. Dual-band operations involving C-band on the high seas and Ku-band in port should not be imposed under any circumstances.

MTN believes that the mobile-satellite service ("MSS") bands are an unworkable choice for ESVs. Simply put, there is not enough MSS bandwidth or satellite capacity available worldwide in sufficient quantity or at a price point economical enough to make the MSS a viable option for ESVs. In addition, ESVs should not be relegated to MSS bands incapable of accommodating them simply on the pretext that ships at sea are "mobile."

As to how specifically to authorize ESV operations, MTN offers two possible models for the licensing of ESVs: the "dockside out" model, which entails the licensing of specific dock areas; and the "VSAT" model, which is patterned after the Commission's approach to the licensing of networks of very small aperture terminals. Licensing, however, is not a prerequisite to continued successful operations of ESVs in bands shared with the FS. In the absence of licensing, ESVs could continue to operate, as they do today, on a strictly non-interference basis

without FCC authorization – provided the Commission formally recognizes this unlicensed approach.

Should the Commission ultimately establish a basis for licensing ESVs, it must not impose any restrictions or conditions that unduly burden such operations, such as the requirement to forward immediately, in writing, any complaints of interference to the Commission, or permitting the Commission to take punitive action against interfering "FSS gateway facilities." The Commission should also avoid limiting licensed ESV operations only to "in or near" U.S. seaports, and reject the restriction that ESVs be licensed as "receive only."

On the other hand, MTN can support the imposition of reasonable restrictions on the minimum antenna elevation angle, minimum antenna diameter, maximum half-power antenna bandwidth, and antenna tracking accuracy of ESVs, as well as a maximum necessary bandwidth in a single operating area of 36 MHz at C-band. MTN opposes, however, ESV license terms shorter than the full 15 years accorded other licensed earth stations, as well as the condition to require ESVs to be coordinated only to specific satellites.

When addressing the various interference and coordination issues raised in this proceeding, the Commission must recall the lack of substantiated instances of interference from ESVs to FS stations. In the absence of such interference, the need for "continuous coordination," such as with the real-time tracking of cruise ships (a bad policy in any case in the post-September 11 environment), is plainly mooted. MTN supports an appropriate coordination distance for C- and Ku-band operations, and notes that it has coordinated ESV operations using distances shorter than those developed in the ITU for both bands.

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To: The Commission

COMMENTS OF MARITIME TELECOMMUNICATIONS NETWORK, INC.

Maritime Telecommunications Network, Inc. ("MTN"), by its attorneys and pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, hereby comments on the Commission's Notice of Inquiry ("NOI") in the above captioned proceeding.[1] With the NOI, the Commission requests comment on a variety of issues related to the authorization of satellite earth stations on board vessels ("ESVs"). As it considers the important issues raised in the NOI, MTN urges the Commission to develop a regulatory approach that ensures the adequate protection of the fixed service ("FS") while accommodating – and not unduly burdening – the use of ESVs in fixed-satellite service ("FSS") networks.

MTN believes that providing a stable regulatory environment for the use of ESVs in FSS frequencies that are shared with the FS must serve as the overarching Commission objective in this proceeding. For more than ten years, ESVs operated by MTN and others have demonstrated a remarkable capacity to enhance the efficient use of FSS spectrum. MTN, for example, uses ESVs to serve the rapidly increasing demands of cruise ship operators and passengers for access

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[1] *Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in Bands Shared With Terrestrial Fixed Service*, Notice of Inquiry, IB Docket No. 02-10 (released February 4, 2002) ("NOI").

to traditional telecommunications services, as well as to provide newer broadband services such as LAN and Internet connections. In so doing, MTN is directly advancing the objective of the Telecommunications Act of 1996, which "encourage[s] the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans . . . ."[2] At the same time, MTN has demonstrated that it is able to provide these services via ESVs in a manner consistent with domestic regulatory regimes, and with principles of sound spectrum management, without causing interference to the co-primary FS.

MTN acknowledges that there is the possibility of ESV interference into other users of the shared bands. In the case of the FSS, satellite operators impose all the operating restrictions necessary to prevent interference into adjacent satellites and other FSS terminals as a condition of the contract for space segment, thereby obviating the need for further regulation of the FSS. On the other hand, there is no regulatory framework in place to prevent the theoretical potential for interference into fixed service operations when ESVs are in motion approaching the coast or operating in port. While this situation must be meaningfully addressed in this proceeding, MTN emphasizes that *after more than ten years of operation, there have been no substantiated instances of interference from ESVs to FS stations under normal operating conditions.* This is a critically important fact that must guide the Commission's actions in the instant proceeding. Indeed, MTN urges the Commission to bear in mind that unduly burdening ESV operations to preemptively address concerns regarding interference will come at an unreasonably high cost – namely, limiting or denying access by the public and ship operators to the many essential services that ESVs alone can provide.

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[2] Telecommunications Act of 1996, Pub. L. No. 104-104, § 706(a), 110 Stat. 56 (1996). In the Act, "advanced telecommunications capability" is defined as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications, using any technology. *Id.* at § 706(c).

In the NOI, the Commission seeks comment on the "feasibility and wisdom of authorizing ESVs."[3] MTN supports the Commission's efforts in this regard, as it believes that the United States needs to take a leadership role internationally on issues concerning the regulation of ESVs because it is in U.S. territorial waters where most ESVs operate. Moreover, in the absence of such leadership, a regulatory regime adverse to the interests of the U.S. could be imposed.

Regarding the best method of authorization, MTN believes that the licensing of ESVs, if implemented carefully and in accordance with the experience that has been gained over the years of ESV operation, could ultimately provide the industry with needed regulatory certainty. MTN outlines in these comments two possible models for the licensing of ESVs: the "dockside out" model, which entails the licensing of specific dock areas; and the VSAT model, which is patterned after the Commission's approach to the licensing of networks of very small aperture terminals ("VSAT"). Licensing, however, is not a prerequisite to continued successful operation of ESVs in bands shared with the FS. MTN believes that in the absence of a viable licensing approach being developed, ESVs could continue to operate, as they do today, on a strictly non-interference basis without FCC authorization, provided the Commission formally recognizes this unlicensed approach. Regardless of the regulatory method the Commission ultimately adopts, MTN implores the Commission not to impose undue burdens to MTN's existing operations (or those of other ESV operators) – especially in light of the lack of any substantiated incidence of interference to the FS from ESVs.

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[3] NOI at ¶ 2.

I. Background

A. Overview Of MTN's Business And Its Use Of ESVs

MTN is the leading provider of satellite telecommunications services to the world's cruise lines and other maritime applications, and thus is keenly interested in the Commission's instant inquiry as to how best to accommodate the rapidly growing demand for an increasingly broad array of ESV-based services. Established more than ten years ago to serve the burgeoning demand for telecommunications services and bandwidth for both passengers' use and cruise lines' administrative use via ESVs, MTN has, within that period of time, developed its services into a cost-effective method of communications upon which a large segment of the cruise line industry has come to rely.

Telecommunications services are provided through an FSS network using ESVs in much the same way that such services are provided through an FSS VSAT network. Like a VSAT network, communications services are provided from a land-based gateway or hub station through geostationary FSS satellites to a network of technically equivalent earth stations placed on cruise line vessels, U.S. Navy ships, and offshore oil and gas rigs and vessels. Each ESV is controlled by the larger hub or gateway station.[4] MTN uses a teleport located in Holmdel, New Jersey as its core gateway for communications services, in part because of the teleport's close proximity to the largest telephony carrier interconnection hub in the United States, which enables interconnection with major telecommunications service providers and Internet backbones.

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[4] MTN recognizes that the blanket licensing of earth stations in a VSAT networks is typically not available in shared bands, such as the C-band. As discussed in Section III.B, *infra,* however, the Commission has recently amended its rules to give operators the option of obtaining licenses for a limited class of small aperture terminal earth station networks in the C-band (i.e., CSATs). *See FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service That Share Terrestrial Spectrum*, First Report and Order, 16 FCC Rcd 11511 (2001) ("*CSAT Order*"). The Commission's flexible approach towards the licensing of CSAT networks could serve as a model for its consideration of ESV licensing.

High demand exists for the provision of FSS service via ESVs. MTN entered the maritime communications business under the name Crescomm Transmission Services in 1988 when, in response to a request from the U.S. Navy, it helped to establish a stabilized antenna platform capable of providing a full motion live video broadcast from Navy ships while at sea. Over time, and in response to the demands of a rapidly growing cruise line industry, MTN has developed a broad range of ESV-based communication service offerings. Today, the list of services MTN provides over ESVs includes business and administrative services, such as:

- shore to ship and ship to shore voice communications
- Internet and intranet access
- customs and immigration data processing
- real-time credit card verification
- inventory management
- passenger cabin assignments
- real-time tracking and satellite performance statistics using GPS technology
- up-to-date weather information access

and passenger and crew services, such as:

- public switched telephone network access
- prepaid and credit card calling from ship to shore
- credit card calling from shore to ship
- automated teller machine transaction processing
- retail Internet cafes
- occasional live television and radio broadcasts while vessels are on the high seas.

Significantly, no service provider is capable of offering a comparable range of broadband services to and from ships and offshore oil rigs with as much capacity, or as quickly, affordably and globally, as MTN does with its ESVs using FSS satellites. While the mobile-satellite and maritime mobile-satellite services of INMARSAT, the sole-source provider of L-band maritime communications, are required to be maintained by certain vessels under the International Convention for Safety of Life at Sea ("SOLAS"), they lack the bandwidth and affordable cost structure to accommodate the capacity and capabilities that are provided by MTN's C-band ESV-based service offerings. In addition, cruise lines use MTN's ESVs for their important

administrative communications, including passenger billing, infrastructure maintenance, customs and immigration information, inventory upkeep, and the like.

Indeed, the cruise line industry relies heavily on the ESV-based equipment that MTN installs and maintains on cruise ships.[5] MTN currently serves in excess of 90 passenger liners worldwide. The equipment MTN installs and maintains is highly specialized, costing more than $200,000 per installation in core hardware alone (i.e., for the stabilized earth station platform and associated infrastructure).

Each cruise ship that MTN services is, in effect, a floating hotel, with up to 3,000 passengers and 1,500 crew members on board. MTN's ESVs allow the cruise lines to offer most, if not all, of the same telecommunications capabilities (from routine calls to ATM transactions to Internet access) as any land-based luxury hotel. Moreover, as a cruise ship approaches its final destination, the ship's operator faces the enormously complex task of checking out each of its current passengers and registering in its new passengers within a four to five hour period of time. Depending on the port of call, the operator may also need to clear passengers through customs and immigration. With the data transfer capabilities available through the broadband ESV network of MTN, a cruise ship operator typically performs these tasks in as little as four hours, thereby saving tremendous amounts of time and money for the cruise line company, while significantly lessening the delays that passengers experience. MTN's services also ease the administrative burdens placed on the U.S. Customs Service and Immigration and Naturalization Service, and significantly reduce congestion in some of the busiest harbors in the world.

Approximately 143,000 passengers and 67,000 crew members are on board ESV-equipped cruise line vessels at any given moment, which represents a considerable consumer

[5] Although servicing cruise lines comprises the bulk of MTN's business, the company also provides ESV-based service to several oil and gas platforms and ESV links to the U.S. Navy.

base dependent upon MTN for its communications needs. Significantly, while many of these ESV-equipped vessels sail to destinations around the world, approximately 82 percent of the passengers on board – and thus the people who most directly benefit from MTN's services – are American citizens.

B. MTN's ESVs Have Not Caused Unacceptable Or Harmful Interference To The Fixed Service In More Than Ten Years Of Co-Frequency Operation At C-Band.

As its business has developed and grown over the past decade, MTN has remained a model "spectrum citizen." MTN currently provides its services in bands allocated to the FSS at C-band on a strictly non-interfering basis, which requires MTN to protect all other authorized services in the band from the potential of harmful interference from MTN and to accept such interference from all other authorized co-frequency services. MTN has diligently operated pursuant to these obligations, and remains prepared and able immediately to terminate interfering operations from any of its ESVs, if necessary.

To date, there has not been a single substantiated complaint of interference from MTN operations into the FS. In fact, there has only been one formal interference complaint filed against MTN with the Commission. This complaint alleged interference from cruise ships in Alaska's inland passage near Juneau during two months in Summer, 2000. No actual data supporting the allegation of interference was supplied with the complaint, such as the date and time of the outages or the carrier frequencies that were said to have been affected. Moreover, MTN demonstrated in its response to the complaint that the alleged interference could not have been caused by cruise ships using their ESV system.[6] With respect to ESVs of other operators

[6] *See* Letter from Eliot J. Greenwald to Mitchell Lazarus, FCC File Nos. SES-LIC-19980911-01272 et al.; SES-STA-20000128-00108 et al. (August 8, 2001) (attaching a report from Pinnacle Telecom Group explaining why MTN was not the cause of the alleged interference). The Commission has not issued a decision in connection with this matter.

worldwide in the same period, MTN is aware of only one incident involving genuine harmful interference to terrestrial fixed services from a ship using ESV equipment. In this anomalous case (which did not involve MTN), a seismic vessel in the port of Stornaway in the Outer Hebrides, Scotland, did interfere with a 6 GHz microwave link while the ship was anchored less than three kilometers from shore. The ESV system on the ship was supplied and licensed by the Norwegian Administration and the matter was settled between the Norwegian and United Kingdom governments. The interference was caused by the highly improbable confluence of equipment malfunction, failure to follow basic operating procedures on the ship, and a lack of intervention by the controlling teleport. The engineering report submitted following investigation of the incident confirmed that the harmful interference did not result from a situation that would arise under normal operating conditions, and that if simple rules of operation had been followed, the incident would have been avoided.

Thus, as a theoretical matter, the potential for interference from C-band operations exists as ESVs approach the coast or are docked in port. As a practical matter, however, based on MTN's many years of operational experience, the risk of harmful interference being caused to the FS by ESVs is effectively *de minimus*.

II. ESV-Based Services Using FSS Networks Must Be Allowed To Continue At C-band, And Should Also Be Allowed To Use Ku-band FSS Networks.

It is internationally recognized that ESVs are operating in FSS networks,[7] and the United States is preparing to propose to the International Telecommunication Union's 2003 World Radiocommunication Conference ("WRC-03") that the ITU Radio Regulations recognize this by adding a footnote in the allocation table for the appropriate C-band and Ku-band FSS uplink

[7] Resolution 82 (WRC-2000) notes "that ESVs may operate in FSS networks in the bands 3700-4200 MHz and 5925-6425 MHz under No. 4.4 of the Radio Regulations and shall not claim protection from, nor cause interference to, other services having allocations in the band[.]"

frequencies and include certain technical conditions.[8] The Commission, however, requests comment on the bands that can best accommodate ESVs, and suggests in the NOI that the mobile-satellite service ("MSS") bands may be the preferred choice.[9] For the type of services that MTN offers via ESVs, and on which its customers and, in turn, their customers have come to depend, the MSS bands are an unworkable, inappropriate choice that would decimate MTN's ESV business. MTN urges the Commission to continue to allow ESVs, in lieu of the MSS bands, to operate in FSS networks in C-band (at 5925-6425 MHz) and in Ku-band (at 14.0-14.5 GHz).

A. The MSS Bands Cannot Accommodate ESV Operations.

Any preconception that the Commission may have to the effect that the MSS bands are the best choice for ESVs, or are even capable of adequately accommodating ESVs, is misplaced. Simply put, there is not enough MSS bandwidth or satellite capacity available worldwide in sufficient quantity or at a price point economical enough to make that satellite service a viable option for ESV operators. Bandwidth, in particular, is lacking. The MSS bands cannot accommodate even 20 percent of the ESVs currently installed on ships around the world. Furthermore, the MSS bands below 4.0 GHz do not provide sufficient throughput for broadband

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[8] As of this writing, the United States is very close to completing work on a draft proposal to WRC-03 under the agenda item 1.26 that would seek to add a new footnote to Article 5 (the Table of Frequency Allocations) on a global basis, and accompany that footnote with a new WRC resolution that spells out the conditions for operation of ESVs in C-band and Ku-band. At the just completed meeting of Working Party 4-9S of the ITU's Radiocommunication Sector, draft WRC-03 Conference Preparatory Meeting text for the ESV agenda item was developed at the urging of the United States that includes these forthcoming proposals as regulatory examples. *See* Document 4-9S/TEMP/127.

[9] NOI at ¶ 16 (noting that "[i]f MSS bands will not adequately provide for [ESV-based] service, we seek comment on which FSS bands should be considered for ESV operation").

applications, which comprise a growing portion of the communications services that MTN and others provide to their customers via ESVs.[10]

That ships at sea or otherwise underway are "mobile" is no reason to disregard the operational history of ESVs and to relegate ESVs to MSS bands that are not capable of accommodating them. Instead, as discussed below, ESVs should be allowed to continue to operate in the FSS C- and Ku-bands, where they have thrived.

B. The Commission Should Permit Continued Use Of The C-band On A Non-Interfering Basis To The Fixed Service.

MTN believes that the FSS C-band is the most appropriate band for ESV-based services because that portion of the spectrum has for years effectively and efficiently accommodated ESVs without causing interference to other operations. ESV service providers, including MTN, have invested significant amounts of money in C-band operations, and have developed over time a burgeoning demand for their services. There is no compelling reason to vacate the C-band and no viable alternative.[11] A Commission decision to prohibit or restrict ESV access to C-band would vitiate MTN's business and render more than $25 million in capital investments obsolete. It would, most certainly, have a dramatic negative impact as well on the cruise line industry, which would be unable to offer passengers the telecommunications services they have come to expect, and who would face lengthier stays in port between cruises.

As the Commission itself notes in the NOI, there are sound business and technical reasons that prompted ESV operators to concentrate in C-band, and which support the continued use of the C-band today. These reasons include the band's broad coverage that permits

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[10] Sixty-four kbps is the highest speed data service currently offered by INMARSAT, whereas all of MTN's ESVs are transmitting at 128 kbps or higher.

[11] While there are regions of the world where Ku-band coverage and availability are adequate for ESV operations, that is not the case in the Caribbean, Alaska and other major cruise areas in North America.

communications anywhere at sea, and equipment that is readily available.[12] In addition, C-band is the only portion of the commercially available spectrum that offers sufficient bandwidth on a global basis – a distinct advantage given the high volume of voice, data and video information that flows through ESV networks on a daily basis. ESV operations in the FSS C-band are also spectrally efficient, in that they put to use spectrum over the high seas that would otherwise lie fallow.

MTN appreciates the concern that some parties have expressed over the potential of harmful interference from its ESV operations into co-primary FS operations at C-band. In the absence of credible evidence of such interference over the past decade, however, one must conclude that the risk of such interference is exceedingly remote.[13] Indeed, MTN's impressive record of co-existence confirms that ESV/FS compatibility is more than just possible, it is routine. This successful co-existence also bespeaks the success of the many measures that MTN has devised and employed to keep the potential for interference to the FS unrealized. For all of these reasons, the Commission should allow ESV operations to continue in the FSS at C-band.

C. In Addition To Continued ESV Use Of The C-band, The Commission Should Also Allow, But Not Compel, ESV Use Of The Ku-band.

In addition to the C-band, the Ku-band has also been used by MTN and other operators for their ESV-based services, and the Commission seeks comment on the continued use of that band.[14] MTN maintains that the FSS Ku uplink band at 14.0-14.5 GHz should be open to ESVs where commercially available and technically appropriate because, in certain instances, Ku-band can alleviate coordination difficulties that may arise with the use of the shared C-band.

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12 NOI at ¶ 18.

13 *See* Section I.B, *supra.*

14 NOI at ¶ 18.

Operations at Ku-band, however, for reasons of technical and commercial necessity, must serve only to complement, and not to replace, operations at C-band.

Several significant factors weigh against the compelled use of Ku-band for ESV operations. Most critically, and as the Commission itself recognizes, Ku-band is typically organized in spot beams that cover landmasses with high population density but which give limited coverage to coastal waters and no coverage of the open seas.[15] This is in sharp contrast to the broad geographical coverage provided by C-band transponders. In addition, Ku-band satellites generally fail to provide sufficient coverage over certain parts of the world (particularly in the Southern Hemisphere) that are frequently traveled by cruise lines and that are of increasing interest to companies exploring for off-shore oil and gas. Even in areas where Ku-band coverage is provided, it is often very difficult to secure access to capacity and typically is more expensive than C-band coverage. Ku-band operations also suffer from service outages in high rain areas, such as the tropics, which are major areas of cruise ship activity. Given these limitations, the Commission should conclude that it is not feasible to mandate the exclusive use of Ku-band frequencies to support ESV operations.

Even exclusive Ku-band operations of a limited nature should be avoided, as in the Commission's scenario involving a limited-range ship traveling only in an area near the coast.[16] As a practical matter, few ships operate only in areas narrowly defined enough to justify exclusive Ku-band use. A cruise ship that travels where Ku-band coverage is available during a local "high season" will, for example, often serve other areas of the globe not covered by Ku-band satellite beams during the "off season." Such a ship would have to be outfitted with both C-band and Ku-band equipment or re-fitted on a seasonal basis. This is a very costly

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15 *Id.*

16 *Id.* at ¶ 20 (giving as an example a cruise ship traveling around the Hawaiian islands).

proposition, and one that is unlikely to be undertaken by the smaller cruise ships that typically ply coastal areas for part of each year. In any event, no commercial ship should have its sailing range (and thus its commercial potential) circumscribed by the requirement of conducting critical ESV operations exclusively at Ku-band.

D. Dual C-band/Ku-band Operations Are Infeasible And Should Not Be Required.

While the Commission should allow ESV operations to continue in the FSS C- and Ku-bands individually, operations requiring the use of both bands – C-band on the high seas and Ku-band in port – should not be imposed.[17] Mandated dual-band operations would work a considerable burden on ESV operators by requiring them to incur the expense involved in providing for both C-band and Ku-band access on each ESV-equipped ship. There simply is no assurance that Ku-band capacity in particular would be available to MTN for such use. Moreover, ESV operators would have to undergo the time-consuming and costly procedure of switching from one band to the other as their ships approach land. In addition, technically, dual-band operations suffer from a relative inefficiency *vis à vis* single-band systems, and from a lack of available equipment. Given these shortcomings, MTN urges the Commission to reject dual-band ESV operations.

III. When Considering The Appropriate Authorization Approach For ESVs, The Commission Must Seek To Establish A Regime That Regularizes ESV Operations And Allows Room For ESVs To Continue To Evolve Their Service Offerings.

In addressing the possible means of regulating ESVs, the NOI specifically requests comment on the "necessity of ESV licensing."[18] MTN believes that the Commission's focus should instead be on the *necessity of providing a stable regulatory regime* for ESVs,

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[17] *Id.* at ¶ 19.

[18] *Id.* at ¶ 14.

notwithstanding whether that regime involves the actual licensing of ESVs. In other words, MTN can support either the licensing of ESVs or an alternative regulatory approach not requiring licensing, so long as ESV operators receive requisite assurance that they have continuing authority to operate as they do today – *i.e.*, on a strictly non-interfering basis to the co-frequency FS. To this end, MTN offers the following two potential licensing models, the "dockside out" model and the VSAT model, as well as a non-licensing alternative.[19]

A. The Dockside Out Licensing Model

The first potential licensing model, termed "dockside out," would require an ESV operator to apply for and receive from the Commission an earth station license covering a particular dock area. License applications would be submitted for each of the 17 U.S. seaports for which ESV operating authority has previously been granted pursuant to special temporary authority ("STA") and additional ports required for cruise line operation. [20]

As set forth in the Resolution 82 (WRC-00), each dockside out license would allow up to 36 MHz for C-band uplink and downlink to be used in each port operating area, thereby affording ample bandwidth to all ESVs in that port area, as well as in the associated channels and shipping lanes. The proposed bandwidth should adequately serve the licensee's needs, as 36 MHz will easily cover operations in even the busiest seaports, such as Miami and Ft. Lauderdale, Florida.

Licenses under the dockside out approach would be permanent (as opposed to temporary fixed) FSS earth station licenses, because operations at each seaport will, in effect, be "fixed" to

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[19] One regulatory approach that merits no further consideration by the Commission is the licensing of ESVs as MSS earth stations. *See* NOI at ¶ 21. For the reasons set forth in Section II.A, *supra*, the MSS bands lack the capacity and economic viability to support ESV operations.

[20] The 17 ports are: Bremerton, WA; Everett, WA; Ft. Lauderdale, FL; Juneau, AK; Ketchikan, AK; Key West, FL; Los Angeles, CA; Mayport Naval Base in Jacksonville, FL; Miami, FL; New Orleans, LA; Norfolk, VA; Port Canaveral, FL; San Diego, CA; San Juan, PR; Skagway, AK; St. Thomas, VI; and Tampa, FL. *See* NOI at n.16.

specific locations at the particular port in question, and not tied to the ships that travel into and out of that port. The frequencies encompassed by the license would be fully coordinated with the terrestrial fixed service – thereby ensuring their protection – just as would any conventional FSS earth station license, and the licensee would be required to possess the ability to remotely shut down interfering ESV operations.

A key component of the dockside out approach is that ESV operators – not ESV-equipped ships – would be licensed. The licensee would be responsible for assigning available frequencies within its authorization to ships in motion entering the relevant seaport's shipping lanes and channels, docking at the pier, and exiting the shipping lanes and channels bound for the open sea. Because the shipboard equipment would not be licensed independently, the concern over the licensing of foreign vessels, which Section 306 of the Communications Act of 1934, as amended, ostensibly prohibits, would be obviated.

In short, under the dockside out model, the licensee would be authorized to provide service to all ships docked at a licensed seaport, or in the shipping channels leading to and from that port, including foreign-flagged vessels. The licensee would be responsible for coordinating the frequencies in its dockside authorization and for ensuring interference-free operations to the FS. In addition, the licensee would provide a single point of contact for ESV operations in the designated ports, and would be responsible for ensuring that the station is turned off in the event of an interference complaint.

For vessels not associated with the holder of a dockside authorization, and therefore not entitled to assignment of frequencies within the licensee's authorization, licensing of ESVs for operation within the distances of the U.S. identified by the Commission would be handled on an STA or waiver basis, as is presently the case.

B. The VSAT Licensing Model

The second potential licensing model is patterned after the Commission's current licensing rules for VSATs in the Ku-band, with necessary modifications to provide for frequency coordination in the C-band. For ESV operations in the Ku-band, licenses would be issued to the gateway earth stations in an ESV system much in the same way they are issued to hub stations in a VSAT network.[21] For ESV operations in the C-band, licensing would be handled in a manner similar to the procedures adopted by the Commission in its recent CSAT order, which authorized C-band networks serving rural areas.[22]

A VSAT-like licensing regime is an appropriate model here because ESV systems function in a way similar to VSAT networks, in that both consist of integrated networks of technically equivalent FSS stations associated with large hub or gateway stations that control their operations. Both C-band and Ku-band authorizations would include the right to establish a specific number of ESV stations. The gateway earth stations associated with the ESVs would have the capability to monitor ESV transmissions and to operate the ESVs remotely (and, thus, retain the ability to shut them down if necessary). The licensee would have full responsibility for immediately and effectively redressing any interference caused by its ESVs in its network. Moreover, gateway operators would be able to assign frequencies to ESVs in a way that minimizes the potential for FS interference. Operation of ESVs not associated with a gateway licensee could be provided for under an STA or waiver as discussed above.[23]

MTN recognizes that, while blanket licensing of ESV earth stations should be possible in the Ku-band, it is typically not permitted in shared bands such as the C-band. To ensure the

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21 *See* 47 C.F.R. § 25.134.

22 *CSAT Order*, 16 FCC Rcd at 11512.

23 *See* Section III.A.

protection of the FS under a VSAT-like licensing approach, the Commission could adopt procedures applicable to ESVs in the C-band similar to the "streamlined licensing" adopted in the *CSAT Order*.[24]

Thus, an ESV operator would apply for licenses for each hub station, and include with its application the maximum number of terminals comprising its ESV network and the satellites they would be using.[25] Following grant of the application, a licensee may add technically equivalent satellite earth stations (up to the number specified in the initial application) by filing the information contained in Schedule B to FCC Form 312 and a coordination notification for that earth station with the Commission.[26] Coordination must be accomplished prior to the time an earth station is placed in service, and would be required for each earth station facility the licensee intends to bring into use.[27]

Both the dockside out and VSAT licensing models discussed above are compatible with the ESV sharing scheme that is now being finalized within the ITU-R. At the October 2001 meeting of ITU-R Working Party 4-9S, one draft new recommendation pertaining to ESVs and the FS was approved. This recommendation provides an example approach for the determination of a composite area within which interference to fixed service stations from ESVs when

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[24] *CSAT Order*, 16 FCC Rcd at 11515. In the *CSAT Order*, the Commission concluded that the contemplated CSAT service was in the public interest because it facilitates the provision of advanced broadband communications for Americans in rural, underserved areas. *Id.* at 11518. Similar public interest benefits are possible with the VSAT-like licensing of ESVs. MTN offers telephone, facsimile, e-mail, and Internet communications to cruise ship passengers, the vast majority of whom are American citizens, at locations where ready communications would not otherwise be possible. The public interest potential of broadband telecommunications at sea through ESV networks was dramatically demonstrated immediately following the terrorist attacks on September 11, 2001. At that time, MTN opened up its network free of charge to allow the approximately 200,000 passengers and crew members sailing on its customers' cruise ships to make or send calls and messages back home.

[25] MTN believes that, as in the case of CSAT licensing, ESV licensing can be limited to the use of a maximum of three satellite locations. *See CSAT Order*, 16 FCC Rcd at 11518. This would also provide assurance that the terminals would conform to the Commission's off-axis eirp density limits associated with blanket licensing.

[26] *Id.* at 11516.

[27] *Id.* at 11520.

operating in motion near a coastline would need to be coordinated.[28] At the April 2002 meetings of ITU-R Working Party 4-9S,[29] three additional new recommendations were approved. The first of these recommendations identifies the minimum distance from the coastline beyond which in-motion ESVs would not cause unacceptable interference to the fixed service in the 5925-6425 MHz and 14-14.5 GHz bands.[30] The second recommendation provides guidance for the determination of the potential interference from ESVs into the fixed service when the ESV is operating within 300 kilometers of the coastline at C-band or within 125 kilometers of the coastline at Ku-band.[31] The third recommendation provides guidance on the choice of a frequency band for the operation of ESVs when considering the possibility of ESV operations within the minimum distances.[32] Copies of all four recommendations, as approved by Working Party 4-9S and presented to the Joint Meeting of Study Groups 4 and 9 in October 2001 and on April 26, 2002, are included as Attachments 1-4, respectively, to these Comments.

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28 *See* Draft New Recommendation ITU-R SF.[DOC 4/85-9/108], Example approach for determination of the composite area within which interference to fixed service stations from earth stations on board vessels when operating in motion near a coastline would need to be evaluated.

29 *See* n.8, *supra.*

30 *See* Draft New Recommendation ITU-R SF.[4-9S/ESV-A], The minimum distance from the coastline beyond which in-motion earth stations located on board vessels would not cause unacceptable interference to the fixed service in the bands 5925-6425 MHz and 14-14.5 GHz. The recommendation identifies the distance at 300 kilometers for C-band and 125 kilometers for Ku-band. An annex to the recommendation provides the assumptions and methodology used in determining these distances in the respective frequency bands. The recommendation includes a note that the minimum distance values are only valid for an antenna size of 2.4 m at C-band and 1.2 m at Ku-band.

31 *See* Draft New Recommendation ITU-R SF.[4-9S/ESV-C], Guidance for determination of interference from earth stations on vessels to stations in the fixed service when the ESV is within the "minimum distance." The recommendation contains three annexes: Annex 1 provides a framework for the overall assessment of interference; Annex 2 provides the basis for the detailed assessment of the interference; and Annex 3 provides supplemental information that may be used to develop a simulation of ESV operations.

32 *See* Draft New Recommendation ITU-R SF.[4-9S/ESV-FREQ], Use of frequencies by earth stations on board vessels transmitting in certain bands allocated to the fixed-satellite service.

C. The Regulation of ESVs Need Not Involve Licensing.

MTN believes that the successful regulation of ESV operations, and the continued protection of FS stations in the C-band, need not entail licensing. MTN today offers its customers an array of ESV-based services while simultaneously protecting co-primary FS operations without formal Commission authorization. Thus, as an alternative to licensing, MTN would support the regulatory status quo – *provided that the Commission formally recognizes unlicensed ESV operations.*

Formal Commission recognition that ESVs appropriately operate through C-band and Ku-band FSS networks would, even without licensing, provide the industry with the necessary "regulatory certainty" that promotes investment and growth. While such recognition could take many forms, at a minimum it should include a modification to Section 2.106 of the Commission's rules to add a footnote or footnotes that expressly state that earth stations in the FSS may operate on board vessels, and language in a Commission report and order that expressly provides assurance to ESV operators that they may continue to provide service on a going-forward basis so long as these services are conducted pursuant to the operational parameters being developed internationally.

IV. Any Licensing Restrictions Or Conditions That The Commission Considers Adopting Should Not Unduly Burden ESV Operations.

The NOI requests comment on appropriate restrictions and possible conditions to place on licensed ESV operations.[33] Should the Commission ultimately determine that licensing is the best means of authorizing ESVs, any restrictions or conditions that the Commission imposes as part of its licensing regime should be imposed only if not unduly burdensome to ESV operators.

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[33] NOI at ¶¶ 21–24.

The Commission should reject out of hand two particularly unnecessary licensing conditions it envisions as responses to potential future FS interference claims: (1) that all ESV operators should be required to forward immediately, in writing, any complaints of interference to the Commission; and (2) that the Commission be permitted to take punitive action against FSS gateway facilities that provide service to ESV stations that repeatedly cause interference to FS stations.[34] Neither proposal merits further Commission consideration because both are excessive reactions to the remote threat of ESV interference to FS stations. Moreover, because viable procedures for interference mitigation and resolution already exist and do not require the involvement of the Commission, both conditions are redundant and would needlessly tax the already limited FCC resources.

In contrast to these unnecessary restrictions, the Commission should condition licensed ESV operations to allow service from ships "in motion" to or from identified U.S. seaports.[35] The alternative approach advanced in the NOI – limiting licensed ESV operations only to "in or near" U.S. seaports – would eliminate broadband service to cruise ships at a point in the voyage when important administrative functions (immigration/customs, passenger billing, etc.) are being conducted. Even more detrimental to ESV service providers would be adoption of a requirement that ESV licenses be limited to "receive only" operations.[36] Such restrictive licensing would strip the ESV service of its commercial viability and quickly put MTN and its competitors out of business. "Receive only" licensing also lacks merit because the Commission does not, as a matter of course, license receive-only earth stations.[37]

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34 *Id.* at ¶ 22.

35 *Id.* at ¶ 23.

36 *Id.* at ¶ 24.

37 *See* 47 C.F.R. § 25.131.

MTN can support the imposition of reasonable restrictions on ESV minimum antenna elevation angle, minimum antenna diameter, maximum half-power antenna bandwidth, and antenna tracking accuracy.[38] In this regard, the provisional technical guidelines in Annex 2 to Res. 82 providing for the minimum elevation angle of an ESV antenna at 10 degrees, the minimum ESV antenna diameter of 2.4 meters at C-band, and the ESV antenna tracking accuracy of 0.2 degrees are each acceptable.[39] These provisions, particularly the minimum ESV antenna size, will help ensure that the use of ESVs will not proliferate beyond cruise ships to pleasure craft, and thus serve as an effective limiting agent on potential interference to the FS. Similarly, MTN supports the maximum necessary bandwidth in a single operating area of 36 MHz at C-band, and the maximum ESV transmitting power spectral density at the input to the antenna of 17 dB(W/MHz) contained in Annex 2 to Resolution 82.[40]

The Commission should not limit ESV license terms to one to three years.[41] Close monitoring of ESV operations is possible without such an onerous requirement, and the FCC has remedies at hand should harmful interference occur. Instead of license terms of up to three years only, the Commission should authorize ESVs for full 15 year terms, as it does with other licensed earth stations.[42]

The condition to require ESVs to be coordinated only to specific satellites – which would significantly limit their azimuths and the portion of the visible arc they would use – should be

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38 NOI at ¶ 24.

39 *See id.* at n.34. The ITU-R has recommended a 1.2 meter minimum ESV antenna diameter at Ku-band, and this too is acceptable to MTN.

40 *See id.* at n.35.

41 *Id.* at ¶ 24.

42 *See* 47 C.F.R. § 25.121(a).

rejected as unduly restrictive.[43] Ships, in particular cruise ships, sail over vast areas across the globe, and consequently need flexibility to use whatever satellite capacity is available to them. In lieu of limiting access to specific satellites as advanced in the NOI, a better means of minimizing the potential for interference in U.S. seaports would be either to limit the arc available in a particular port or to designate a range of satellites that could be used in those ports. Moreover, ships may use less than the full complement of available spectrum in any given port operating area and, therefore, licenses could be issued for less than the full band – as in the case of the dockside out licensing approach discussed above.

V. Actual, Not Potential, Cases Of Interference Should Guide The Commission's Consideration of ESV/FS Coordination Issues.

In the NOI, the Commission specifically requested comment on whether existing MTN systems have "in fact caused interference to other operations."[44] MTN welcomes the opportunity to set the record straight in this regard because, as noted, not a single credible complaint of interference from an MTN ESV system into an FS stations has ever been lodged. Moreover, frequency coordination and interference resolution procedures put in place by the Commission more than 30 years ago have been highly successful in keeping interference between the FSS and FS to a minimum, while also providing an expedited method for the licensees to work together directly to resolve incidents without involving Commission staff. Based on its successful operational experience in the 17 ports coordinated under STA from 1997 to 2001, MTN believes that these same proven procedures would be adequate for ESV networks licensed to operate in U.S. ports. Accordingly, when addressing the various interference and coordination issues raised

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43 NOI at ¶ 25.

44 *Id.* at ¶ 30.

in the NOI, MTN urges the Commission to bear in mind the impressive record of co-existence at C-band that ESVs have achieved to date, and which is predictable in the future.

The lack of substantiated, legitimate instances of interference moots the need for the "continuous coordination" advanced by the Commission.[45] Continuous coordination is also bad policy if made public, as it would likely pose a serious safety risk. Real-time location tracking of cruise ships available through the Internet (or any other public means) in the post-September 11 environment would create a considerable security threat to those ships and the thousands of passengers they carry (the vast majority of whom are American).[46] Instead, ESV licensees should only be required to provide such tracking information to responsible public safety authorities, the Commission, and authorized representatives of the licensees in shared bands upon request.

MTN believes that the potential for ESVs to cause harmful interference to fixed service systems would be negligible beyond the "Minimum Distance" from shore. [47] These distances have been developed in the ITU for both C- and Ku-bands. *See* ITU-R SF [Doc. 4/95-9/154]. MTN, however, has coordinated ESV operations using shorter distances as stipulated in a waiver granted to MTN in 1996, [48] and no incidences of interference have resulted using these distances.

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[45] *Id.* ("We believe that if we license ESVs, flexible, efficient and *continuous coordination* would be the key component to ensuring that ESVs do not cause unacceptable interference to FS stations.") (emphasis added).

[46] *See id.*

[47] *See id.* at ¶ 26.

[48] *See Mobile Satellite-Based Communications Services by Crescomm Transmission Services, Inc. and Qualcomm Incorporated*, Order, 11 FCC Rcd 10944 (Int'l Bureau and OET, 1996).

MTN supports the coordination of operations within the Minimum Distance areas using the recommendations of Working Party 4-9S.[49] Under these recommendations, the composite coordination area for ESVs is constructed by first determining the coordination area at individual points along the extremes of the shipping lanes and channels that lead to the intended docking position (called the "operating contour"). The individual coordination areas are determined using standard procedures for FSS earth stations at fixed locations. The individual coordination areas are then joined into a single composite area. Figure 1 below shows the composite coordination for a hypothetical port with its associated shipping lanes and channels. The potential for interference from ESVs operating into stations in the fixed service within the composite coordination area can be analyzed using the methods given in the Working Party 4-9S recommendation providing guidance for the determination of the potential interference from ESVs when within the Minimum Distance.[50]

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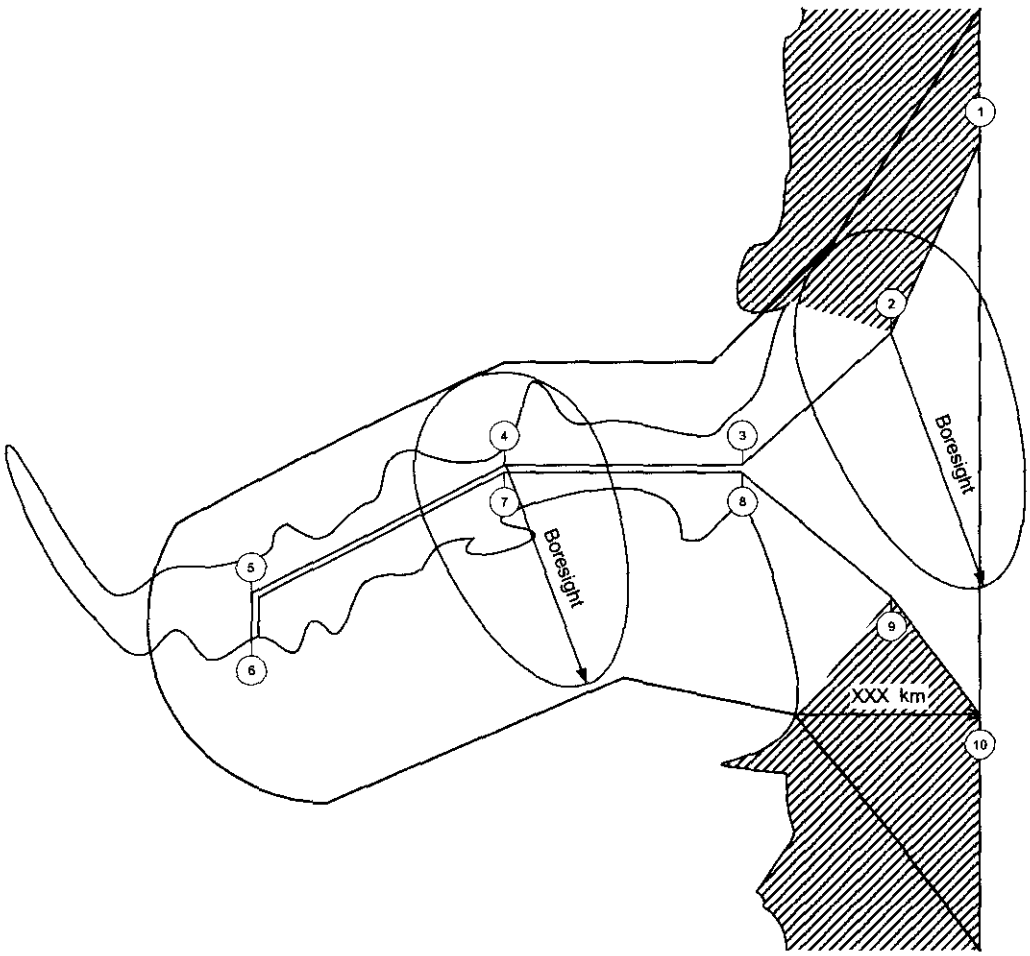
[49] *See* Draft New Recommendation ITU-R SF.[Doc. 4/85-9/108], Example approach for determination of the composite area within which interference to fixed service stations from earth stations on board vessels when operating in motion near a coastline would need to be evaluated.

[50] *See* n.31 *supra*.

Figure 1: Composite Coordination Area



The NOI sets out a number of "other approaches" involving the provision of certain ESV licensee information that would enable the source of interference, should it occur, to be quickly identified.[51] In MTN's view, these approaches are unnecessary. MTN already has a single point of contact for all of its ESV operations at the Holmdel, New Jersey, gateway. This teleport has detailed information about the ESV systems on each ship in the network, including the frequencies assigned to these ESVs, their location, and the status of transmissions to and from them. Moreover, the teleport keeps contact numbers for all the ships within the MTN system.

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[51] *See* NOI at ¶ 31.

MTN does not believe, for the security reasons discussed above, that it would be prudent to make such information available to the public over the Internet. Nevertheless, authorized representatives of licensees in shared bands seeking to resolve interference incidents could have ready access to the information in a timely and expeditious manner. Importantly, this exchange of information could be accomplished with little or no involvement on the part of the Commission, through the usual interaction between frequency coordinators representing the two systems, or by having the frequency coordinator representing the FS system contact the Holmdel gateway directly.

MTN reiterates that it can, from its Holmdel gateway, monitor, control and remotely terminate transmissions from the ESV immediately if necessary. Moreover, MTN's ESV systems can cease transmission automatically if they lose synchronization with the downlink from the satellite, if the receive signal parameters fall outside a specified range, or if the ship motion exceeds certain limits. In short, several mechanisms already exist that are designed to prevent interference from the FSS to the FS from occurring in the first place, or to terminate interfering transmissions immediately in the unlikely event of such an occurrence.

VI. Conclusion

Over the past ten years, ESVs have become an indispensable component of the successful operation of cruise lines and other maritime applications. Cruise line companies, in particular, have come to rely on ESVs to meet their administrative and business communications needs, as well as the communications needs of the more than 200,000 passengers and crew members on board cruise ships at any given moment. Because no viable alternative to ESVs exists, denying or limiting cruise line operators and other maritime companies the use of ESVs would greatly disserve the public interest.

As explained in these comments, the wide range of communications services MTN offers has not resulted in a single verified instance of interference to co-primary terrestrial fixed service stations at C-band. Given this impressive record of co-existence, MTN urges the Commission not to unduly burden operators as it seeks to authorize ESV-based services. Specifically, MTN recommends that the Commission either propose to license ESV operators according to the dockside out or VSAT models set out above, or permit ESVs to continue to operate as they do today. If it takes the latter route, the Commission should formally recognize that ESVs may operate, subject to certain conditions, as part of FSS networks. In either of these ways, ESVs will continue to provide the types of communications services that they alone can provide without causing any detrimental effect to the FS.

Respectfully submitted,

MARITIME TELECOMMUNICATIONS NETWORK, INC.

By: 

Raul R. Rodriguez
Stephen D. Baruch
Philip A. Bonomo

Leventhal, Senter & Lerman P.L.L.C.
2000 K Street, NW
Suite 600
Washington, DC 20006
(202) 429-8970

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Its Attorneys